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ABSTRACT

This is one of the outcomes of the work of the Massachusetts Evaluation Service Center for Occupational Education (ESCOE). This programmed text is intended for use by teachers in occupational education. Some of the theory and background associated with behavioral objectives is included. The main emphasis is on teaching the skill of writing a behavioral objective. The book is designed to teach these three main objectives: (1) from memory list the three requirements of a behavioral objective, (2) given a list of eight behavioral objectives, discriminate between those containing the three requirements and those that do not contain the three requirements, and (3) given four brief descriptions of instructional content in a variety of subject matter areas, construct a behavioral objective for any two that includes the conditions, performance, and extent. To obtain these objectives the teacher is asked to respond to questions and exercises, the answers being supplied on the next page. The items to be tested on are: background information, requirements for a behavioral objective, identifying objectives written in behavioral terms, writing behavioral objectives, other considerations related to behavioral objectives, and criterion-referenced test items for text objectives. (Author/BP)

ED 097418

Final Report

Evaluation Service Center for Occupational Education

APPENDIX L:

WRITING BEHAVIORAL OBJECTIVES

FOR

OCCUPATIONAL EDUCATION

- A PROGRAMMED TEXT-

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Evaluation Service Center for Occupational Education
Center for Occupational Education, School of Education
University of Massachusetts, Amherst, Massachusetts

June 1972

WRITING BEHAVIORAL OBJECTIVES

FOR

OCCUPATIONAL EDUCATION

a programmed text

by Richard G. Allan

in collaboration with the Massachusetts and New York Evaluation Service Center for Occupational Education

at

The University of Massachusetts

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INTENDED AUDIENCE

This programmed text is intended for use by teachers in occupational education. Some of the theory and background associated with behavioral objectives is included. However, the main emphasis is on teaching the skill of writing a behavioral objective. Sample objectives are included from many different areas of occupational education.

OBJECTIVES

This programmed text will teach you to:

1. From memory, list the three requirements of a behavioral objective.
2. Given a list of eight behavioral objectives, discriminate between those containing the three requirements and those that do not contain the three requirements.
3. Given four brief descriptions of instructional content (the descriptions will contain conditions, performance, and extent) in a variety of subject matter areas, construct a behavioral objective for any two that includes the conditions, performance, and extent.

INSTRUCTION

This is a programmed text. That means you will be taught the objectives listed on the previous page. Upon completion of this text, you will be tested on those three objectives. All through the text you will be asked to respond to questions and exercises. Respond in the book. The "book answer" for these questions and exercises is always supplied on the next page. Occasionally you will be given options while going through this book. One option will enable you to receive more background information, or pratice, while the other will allow you to skip ahead. The choice is yours.

You are strongly urged to respond to the questions and exercises since the book teaches the skill of writing behavioral objectives. And, the best way to learn this skill is by actually practicing writing them.

INTRODUCTION

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I'M READING A BOOK ON USING BEHAVIORAL OBJECTIVES!
IS THIS SOME NEW FORMAT?
WHAT ARE THEY?
WHAT'S THE MATTER WITH THE WAY WE'RE DOING THINGS NOW?
TEACHERS LOUNGE

THE BEHAVIORAL OBJECTIVES HELP CLARIFY MY INSTRUCTION
HOW?
DO THEY CHANGE EVERYTHING WE TEACH?
I LIKE THE OLD WAY BETTER
TEACHERS LOUNGE

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WHAT DO YOU USE AS A GUIDE FOR TEACHING?
I HAVE AN OUTLINE OF WHAT I'M GOING TO TEACH
I USE AN OUTLINE FROM MY TEACHER 30 YEARS AGO
I HAVE AN OUTLINE TOO

THAT'S THE PROBLEM-MOST OF US HAVE BEEN USING OUTLINES OF WHAT WE'RE GOING TO TEACH
I THINK I SEE, MAYBE THE STUDENT SHOULD BE THE FOCUS OF INSTRUCTION
HOW'S THAT A PROBLEM?
I'M THE BOSS IN MY CLASS

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THINK ABOUT THIS A MINUTE – IF THE OUTLINE IS FOR YOU, WHO'S AT THE CENTER OF INSTRUCTION? WHO IS THE FOCUS OF YOUR CLASS?
I'M GOING TO TEACH YOU HOW TO CHANGE A TIRE
LESSON FOR TODAY
NOW, WE HAVE HERE A.....
IF YOU THINK STUDENTS ARE MOST IMPORTANT, I'M LEAVING

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RIGHT, AND WHAT DOES AN EMPLOYER WANT TO KNOW?
HE WANTS TO KNOW WHAT THEY CAN DO
HE ALSO WANTS TO KNOW HOW WELL THEY CAN PERFORM
TEACHERS LOUNGE

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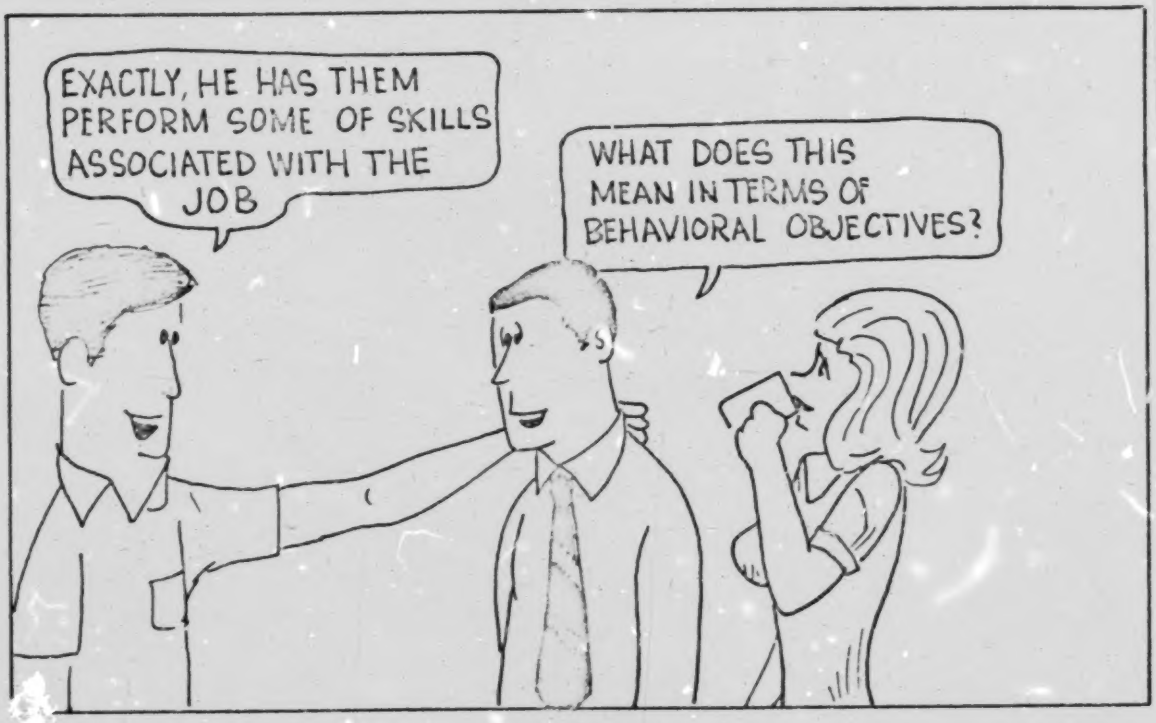
EXACTLY, HE HAS THEM PERFORM SOME OF SKILLS ASSOCIATED WITH THE JOB
WHAT DOES THIS MEAN IN TERMS OF BEHAVIORAL OBJECTIVES?

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BEHAVIORAL OBJECTIVES FOCUS ON THE BEHAVIORS THE STUDENTS ARE TO LEARN IN THE COURSE
I GUESS THAT'S LOGICAL
SEEMS TO ME WHAT THE STUDENTS ARE GOING TO LEARN REALLY OUGHT TO BE THE FOCUS OF THE INSTRUCTION ANYWAY

Question 1. What do you think behavioral objectives are?

(more than one answer may be correct)

_____ a. A teacher's outline.

_____ b. The behaviors the students should learn to perform in the class.

_____ c. Statements that give the instructor a general outline of course content.

_____ d. Statements that tell the instructor exactly what the students are to learn, how well they are to learn, and necessary conditions under which learning is to take place.

1. Answers: If you chose b, and d, continue with question 2. If you chose any other answers, read the explanation below.

a - No. Behavioral objectives state what the students will learn to do, not what the teacher will do.

b - Correct

c - Behavioral objectives are specific, not general. They state the exact behavior to be performed by students rather than the general topical area to be covered.

d - Correct. This answer adds some detail to what has been presented earlier. As well as the behavior to be performed by students, behavioral objectives include any conditions under which the behavior is to be performed and how well the behavior must be performed (i.e., in 10 minutes, 4 of 5, within 1/100th of an inch tolerance, etc.)

Question 2. Why should behavioral objectives be used in designing instruction?

_____ a. They are a new gimmick.

_____ b. They focus on student learning rather than on the teacher.

_____ c. They should state the skills necessary for job success.

_____ d. Objectives provide general guidelines for a course of instruction.

(Question 2 continued)

_____ e. Use of behavioral objectives leads to more definite control over what is taught and more accurate determination of when students have mastered a particular skill or concept.

_____ f. Behavioral objectives are vastly different than anything teachers are now doing.

---

2. Answers: If you chose answers b, c, and e, continue to the directions on the next page. If you chose any of the other answers read the explanations below.

a - They are not a new gimmick at all. Careful research and gradual implementation of behavioral objectives has been continuing since the early 1960's. Teachers using behavioral objectives find students can focus much better on the important things to learn.

b - Correct. Student learning is vital. A carefully conceived instructor presentation is worthless if not much student learning takes place.

c - Correct.

d - Behavioral objectives should state the exact skills to be learned by the students, not general skills. There is a vast difference between the general skill of "being able to type" and the specific behavioral objective of "given a typewritten copy, the student will type at the

rate of sixty words per minute for a period of five minutes with no more than two errors per page." It is very difficult to pin down what is meant by "be able to type." Does this mean hunt and peck with two fingers or is some sort of speed and lack of errors implied? With the behavioral objective there is no doubt about what the student must be able to do.

e - Correct.

f - Use of behavioral objectives requires teachers to state formally some things that they probably have been doing intuitively all along. Teachers usually have an idea of what the students should learn. Writing these behaviors out as behavioral objectives helps to clarify for both teachers and students what must be learned, and consequently, what must be taught.

directions

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If you are interested in more background information on objectives, please continue on the next page -

If you are familiar with the background of behavioral objectives and want to begin learning to write them, turn to page 18.

BACKGROUND INFORMATION

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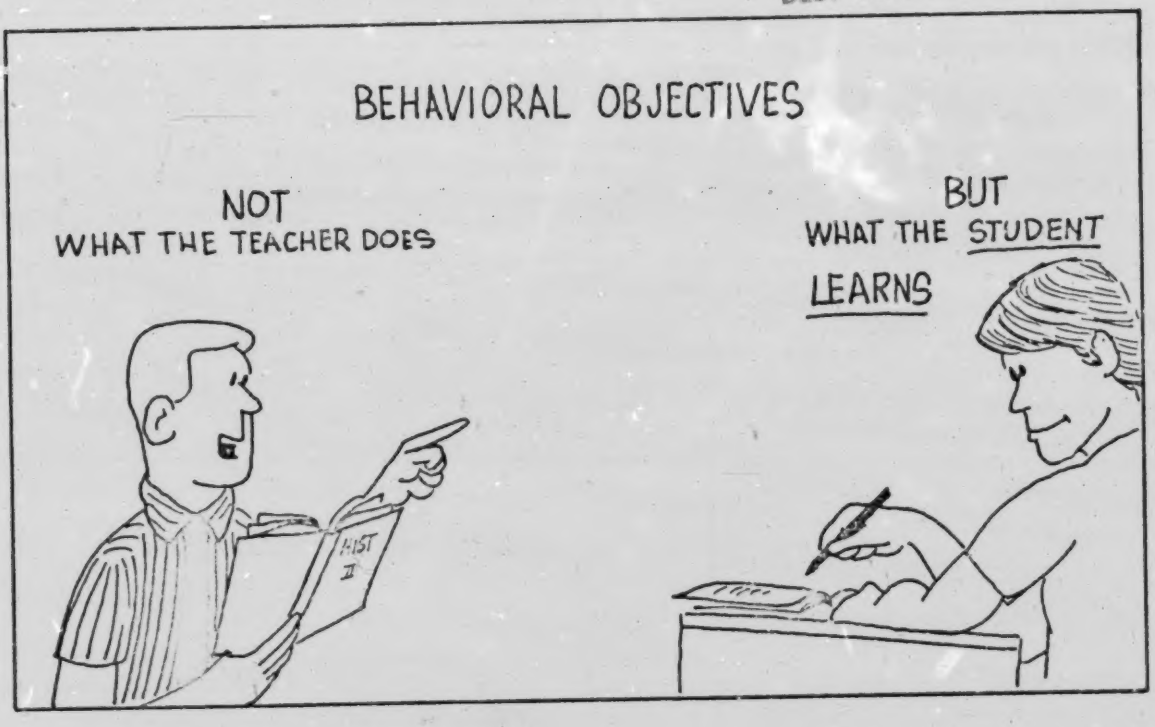

Behavioral objectives should state all the skills a student will be expected to perform upon course completion. Rather than the teacher outlining what will be taught in the course, he/she states with behavioral objectives, what the student will learn. This is a subtle, but important, difference. The focus should be on student learning. Whether this learning occurs through outside reading, talking with classmates, or practicing on equipment is more important than whether or not the teacher presented a lecture on the topic.

Occupational education has been using a style of course development that is readily adaptable to the use of behavioral objectives. The objectives should state the performance expected of course graduates. This is determined by closely examining the job for which the students are being trained. Then the behaviors expected of people entering the job should be stated as behavioral objectives for the course. This means their performance, the conditions under which they perform, and the extent of the performance are stated. The job of the teacher, then, is to teach the performance specified in the behavioral objectives to the students in the course.

Let's look at some random behavioral objectives from a "clerk typist" course. The topics are: (1) correcting typographical errors and (2) changing ribbons. Using behavioral objectives, the teacher would not tell the students "I will teach you to correct typographical errors and change ribbons today." Those statements focus on what the teacher will do. Also, the statements are extremely "fuzzy." How well do the students need to perform? What is passing? Questions such as these are nebulous to the students. The students would be unsure as to when they had gained the necessary skills.

If the teacher used behavioral objectives, the students would be told, "What you need to learn to do is: (see next page)

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1. Given a liquid or chalk-type eraser and typed page with errors, the student will correct all typographical errors. The evaluation will be based on (1) all errors will be corrected within a set time limit, (2) paper is not torn through by erasers, (3) other typing around the error is not smeared, (4) the correction hides any sign of an erasure, and (5) the correction is exactly on the line of typing and properly fills the space it should occupy.
2. Given a Smith-Corona electric portable typewriter and ribbon, the student will change the ribbon within three minutes and the ribbon must flow freely."

Both the student and teacher will have an accurate idea what the student must learn and when this learning has been accomplished.

Question 3. Check the conclusions you have drawn so far on the use of behavioral objectives.

_____ a. All instruction is bad that is not based on behavioral objectives.

_____ b. Behavioral objectives lead to student-centered rather than teacher-centered instruction.

_____ c. Using behavioral objectives automatically insures good instruction.

_____ d. The student knows what he must learn, as well as when this learning has occurred if behavioral objectives are used.

_____ e. Students may be less well prepared for jobs.

_____ f. Teaching methods are limited by the use of objectives.

_____ g. Using behavioral objectives causes teachers and course developers to think out carefully what they wish to teach and exactly what the students must do to show that they have learned the skills for job success.

_____ h. It is difficult to measure attitudinal objectives such as "understanding" or "appreciating" when using behavioral objectives.

_____ i. The testing used is probably different from the usual norm-referenced type of test.*

_____ j. Behavioral objectives have not been used very often in occupational education type courses.

_____ k. Behavioral objectives are probably more difficult to develop for occupational education than for other areas.

* Norm-referenced testing is the type used in most classrooms where a student's performance is graded in relation to how well his classmates did. You can say that John did better than Bill, and Suzy did not do as well as Alice.

---

3 Answers: Check your answers below.

a - This is not true. Behavioral objectives provide point and direction for a course. They also let students know what they must learn. But, it is obviously possible for a course to be brilliantly taught without behavioral objectives. Objectives are a powerful aid, but do not, in themselves, make instruction good or bad.

b - Yes, the focus of the course is on what the students will learn to do rather than what the teacher does.

c - No. Unless the objectives are well constructed and lead to attainment of job skills they do not help. Also, good objectives, poorly taught, are not too helpful.

d - Yes. This is very important to students.

e - No. If the objectives are based on skills necessary for job performance, the students should be well prepared for their jobs.

f - It is better to say that teaching methods are focused. If the objective calls for the student to do something with a particular piece of equipment, then the instruction must lead to his performing the stated behavior on the equipment specified.

g - Yes. Many teachers who have been teaching for years and years find that using behavioral objectives calls for a very careful rethinking of what they are teaching.

h - Yes and No. See the explanation of this on the next page.

i - Criterion-referenced tests are used with behavioral objectives. Criterion-referenced tests will be explained more fully later in the text.

j - False. Behavioral objectives have been used for over a decade in occupational education. The military service pioneered their use, because of the need to train personnel rapidly for jobs.

k - Actually behavioral objectives fit in with occupational education extremely well. This is because there is a particular job with identifiable skills for which students are being trained. All you need to do is state these skills as behavioral objectives.

A final point to be made in this section or background information concerns teaching "attitudes." The question is often raised: "How do you state understandings, appreciations, attitudes, and the like as behavioral objectives?" For instance, you might want to teach your students to have a courteous attitude toward customers. You will soon learn that you can <u>not</u> state a behavioral objective that says-"be courteous to customers." Why? Because how do you see courtesy, how do you measure courtesy, and how do you tell when it has been attained? Usually a teacher has certain signs or traits that can be observed to see if courtesy exists. They might be:

(1) smiling

(2) friendly greeting

(3) calling a customer by name

You see, these are all observable behaviors. This is how you write behavioral objectives for attitudes. You break them down into the observable components that indicate that the attitude exists. Then you write your behavioral objectives based on the observable components. An example for courtesy might be:

> Given a simulated situation where a customer enters the store, the student will greet the customer with a smile, call him by name if possible, and make some comment such as "good morning," "it's a nice day," or "I hope the snow stops soon."

REQUIREMENTS OF A BEHAVIORAL OBJECTIVE

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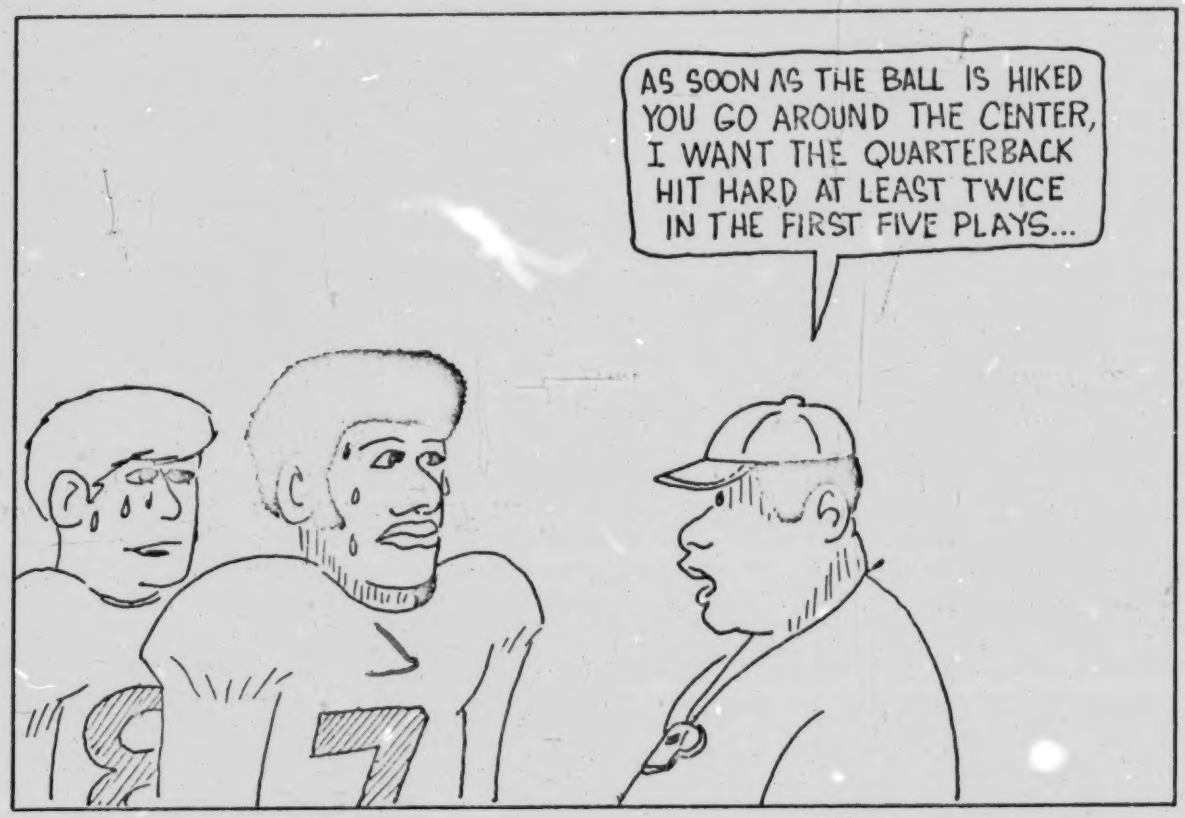

There are definite guidelines to be followed when writing behavioral objectives. 1 - Objectives must describe the desired end-behaviors of course graduates. 2 - Objectives must be stated in clear, concise, and easily understood language. Following are the three requirements for well-written objectives:

- condition
- performance
- extent

Performance

This is the behavior to be exhibited by the student. The performance must be observable and measurable, such as listing, typing, defining, stating, comparing, repairing. The performance should always be a skill or trait desired of a course graduate such as changing a tire or greeting a customer.

Condition

Conditions specify the environment within which the behaviors are to be performed, i.e., the necessary materials and equipment for student performance, or any limitations or restriction pertaining to the use of such materials and equipment.

Example -

Given twist drill, specifications, and manufacturers catalog, the student will make a drawing of a twist drill with terminology in accordance with drafting standards, within one half hour.

Using a thermometer calibrated in either Fahrenheit or Centigrade degrees, the student will read the temperature to the nearest degree.

Given a waving lotion, comb, and patron, the student will prepare a side-part fingerwave so that the waves are smooth, matching, and of uniform width, within thirty minutes.

From memory, list the three tempers of brass for use in press work with at least two of the three listed correctly.

The "givens," "using," and "from memory," tell both the instructor

and the students the conditions under which the student will be expected to "draw," "read," "prepare a wave," or "list." Note that "from memory" implies a restriction rather than some materials or equipment to be used by the student.

Extent

The extent states how well the performance is to be accomplished. In the example above on reading a thermometer, it must be read to the nearest degree. Two degrees error and the objective has not been accomplished.

Other examples -

Given a miter box, dowels, and specifications, the student will cut the dowels to within + - 1/16" of the specified length.

Given an IBM Selectric typewriter and typewritten copy, the student will type 80 words per minute for five minutes with no more than one error per page.

Mastery of each skill is considered mitering the dowels within plus or minus 1/16" or typing 80 words per minute for five minutes with no more than one error per page. The objective has not been accomplished until the extent of performance has been reached.

Question 4. Match each of the objective requirements with the appropriate description.

Objective Requirements	Description
( ) Condition	a. The degree of proficiency. A statement identifying the acceptable level of performance.
( ) Performance	b. What the student is given or not given, what is used, or the environment where something takes place.
( ) Extent	c. What the student is to do. An observable act demonstrating satisfactory achievement such as typing, solving a problem using Ohm's Law, or locating a book in a library.

4 Answers (b) conditions under which student performs

(c) student behavior or what he must do to show satisfactory achievement

(a) how well the student must perform

Cautionary Note: The order of condition, performance, and extent may vary. There is no "right way." The following objective is accurate in either of its forms.

Given access to a card catalog and library stacks, locate Goldfinger by Ian Fleming with no outside help.

or

Locate Goldfinger by Ian Fleming with no outside help when given access to a card catalog and library stacks.

The three parts of a behavioral objective are identified below by:

Condition with one line

Performance with two lines

Extent with three lines

Example -

When provided a picture of the front view of five houses of typical colonial architectural styles, write the names of the architectural styles of any four.

Question 5. Identify the components of the following objectives with <u>one</u>, <u>two</u>, or <u>three</u> lines as illustrated above.

a. Given the drawings of five standard logic circuit symbols, write the names of any four symbols.

b. Given ten two digit by two digit multiplication problems (such as $\begin{array}{r} 85 \\ \times\ 21 \end{array}$ $\begin{array}{r} 23 \\ \times 62 \end{array}$), solve at least nine of the ten correctly.

5 Answers:

a - Given the drawings of five standard logic circuit symbols, write the names of any four symbols.

b - Given ten two digit by two digit multiplication problems (such as $\begin{array}{r} 85 \\ \times 21 \end{array}$ $\begin{array}{r} 23 \\ \times 62 \end{array}$), solve at least nine of the ten correctly.

An objective that includes all three requirements will clearly show what the student must learn. Also, both teacher and student will be able to tell when this learning has occurred and when the student is ready to move on to the next objective.

Question 6. As a review, list the three requirements of a behavioral objective:

a. _____

b. _____

c. _____

6 Answers: in any order

a - condition

b - performance

c - extent

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TAKE A BREAK

IDENTIFY OBJECTIVES WRITTEN IN BEHAVIORAL TERMS

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To be clear and easily understood, an objective must state an observable performance. The performance expected of the student should be something that can be seen and measured, otherwise it is not possible to tell whether or not the behavior has been attained!

Some vague terms that must be avoided are:

understands carpentry

appreciates good hairdressing

knows safety precautions

Terms that require the student to perform an observable act must be substituted for vague terms such as understanding or appreciating. Use words such as list, describe, state, perform, build, compare, etc.

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Question 7. Evaluate the following statements. Check any that contain the requirements of a well-written objective.

_____ a. Be familiar with a radial saw

_____ b. Understand nail polishing

_____ c. Appreciate Ohm's Law

_____ d. Indicate knowledge of proper filing procedures

_____ e. Know the operation of a four cycle engine

Instead of giving you the answer for question 7 immediately, think about these questions for a minute.

a. Are any of the behaviors called for in question 7 observable?

___ YES ___ NO

b. Would all teachers test each of those objectives in the same way or would a series of quite different test questions be written?

_____ all teachers would write the same kind of test items for each objective

_____ different teachers would probably test each objective differently

c. Could you tell, if you were a student, when you had accomplished each of those objectives?

___ YES ___ NO

d. If you were a teacher, would you know exactly what to teach your students based on those objectives?

___ YES ___ NO

Answer 7. Hopefully, by now you see that the terms "be familiar with," "understand," "appreciate," "know," etc. are all unobservable. It is <u>not</u> possible to determine when a student has accomplished an objective which is stated in such vague terms. None of the objectives are acceptable.

(the answers anticipated for the questions on this page were
a. NO b. test objectives differently c. NO d. NO)

Review

Unless an objective contains a behavior (performance) that can be seen and measured, it is vague. Examples of behaviors that can be seen are list, write, measure, state, build, add, diagram, etc. Examples of behaviors that cannot be seen are think, understand, appreciate, know, be familiar with, etc.

The condition must also be indicated. Any equipment or limitation must be noted. This means the lumber, reference materials, lab equipment, etc. that the student is expected to use must be listed in the objective. Conversely, if the student is expected to perform with no equipment or from memory this should also be listed because that is the condition under which he must perform.

The extent tells both student and instructor how well the student must perform. The extent sets the point between success and failure. If the student can solve 4 of 5, cut to within + - 1/16", state without error, etc. he has then passed and can go on. If not, he needs to spend more time learning the material.

Question 8. Check each of the following that is a good objective (i.e., contains the three requirements).

_____ a. Fix a generator.

_____ b. From memory, list at least four of the first five Presidents of the United States.

_____ c. Solve two algebra equations.

_____ d. Given a dictaphone recording, electric typewriter, paper, type 70 words per minute with no more than 1 error per page.

_____ e. Given a blue print, conduit, and motor, the student will install a run of conduit for a motor circuit according to national and local code specifications.

_____ f. Given a baseboard, necessary tools and hardware, understand baseboard installation with hairline accuracy at joints (mitres & copes).

_____ g. Given 2 ounces of lean meat, cut the meat into cubes for a beef stew.

8 Answers. b, d, and e are acceptable objectives

a - No conditions or extent

b - This is clear.

c - This would require knowledge of every algebra equation that exists because the type of equation is not indicated in the conditions.

d - This is clear.

e - This is clear.

f - This objective does not contain an observable performance.

g - There is no extent for this objective. What if the student cut the meat in half, or in 1/32" cubes? Obviously neither of these extremes is acceptable. You would probably want to say the cubes of meat should be about 1/2" cubes. Then you have an extent that will tell you whether or not the objective was accomplished.

If you got question 8 correct and are ready to begin rewriting poor objectives, skip the following review and turn to page 35. If you would like more practice discriminating between clear and vague objectives, continue with the review.

review

The first thing you need to do is make sure the performance in your objective is observable.

Question 9. Check the word that indicates observable performance.

_____ a. feel confident

_____ b. translate

_____ c. identify

_____ d. rewrite

_____ e. like

_____ f. dissect

_____ g. multiply

_____ h. add

_____ i. appreciate

_____ j. know

_____ k. separate

_____ l. draw

_____ m. listen

_____ n. think

_____ o. understand

_____ p. reorder

9 Answers. b, c, d, f, g, h, k, l, p.

Question 10. List the defects of the following objectives

a. Divide numbers.

defects _____

_____

b. Given a choice of materials and tools, the student will construct electrical wire splices.

defects _____

_____

c. Assemble a door jamb.

defects _____

_____

d. The student will make corrections and type into final form five sentences without error.

defects _____

_____

10 Answers

a - The problem is obvious. No conditions or extent are included in the objective. An acceptable objective would read:

Given 5 problems in simple division (such as $5\overline{)20}$, $9\overline{)36}$, $2\overline{)51}$), solve at least four correctly.

b - No extent is included. An acceptable objective would read:

Given a choice of materials and tools, the student must construct a minimum of five types of electrical wire splices that conform to N.E.C.

c - Only the performance is listed here. No conditions or extent appear. An acceptable objective would read:

Given a jambstock, choice of tools, materials, and measurements of a door size, assemble the door jamb within + - 1/32" of given measurements.

d - No conditions are included for this objective so there is no way of telling what the five sentences are like that will be typed. An acceptable objective would read:

Given five sentences in rough draft form with proofreader's marks inserted, the student will make corrections and type into final form without error and including all proofreader corrections.

Do you see how much clearer the objectives are when all three requirements are included? Both teacher and student know what the end result of the instruction should be and when this end result has been attained.

If you skipped ahead following question 8 - begin here

Question 11. Check the unacceptable objectives and list their defects.

_____ a. Given an assortment of any ten electrical condulets, identify and verbally describe the use of at least eight of the condulets.

defects _____

_____

_____ b. Given a diagram of a ten-key adding machine with 13 numbered parts, the student will identify the parts.

defects _____

_____

_____ c. State the names of three types of magnets.

defects _____

_____

_____ d. Given a hand plane, disassemble and adjust the plane blade so the chip breaker is within 1/32" of the blade edge.

defects _____

_____

_____ e. Label the five parts of the brain.

defects _____

_____

11 Answers

a - This is acceptable.

b - There is no extent included in this objective.

c - There is no condition listed and the extent is a bit hazy.

d - This is an acceptable objective.

e - There is no condition listed and the extent is hazy.

Question 12. Rewrite the objectives that are not acceptable (i.e., do not contain the 3 requirements). Do not worry if you are not an "expert" in the subject matter area. The main idea is to include the missing components, so use your imagination and general experience to add the missing components to these objectives.

b. Given a diagram of a ten-key adding machine with 13 numbered parts, the student will identify the parts.

rewrite _____

_____

_____

c. State the names of three types of magnets.

rewrite _____

_____

_____

e. Label the five parts of the brain.

rewrite _____

_____

_____

12 Answers

b - Given a diagram of a ten-key adding machine with 13 numbered parts, the student will identify all 13 parts.

c - Given a bar magnet, horseshoe magnet and round magnet, the student will state the names of all three magnets - no error.

or

From memory, write the names of at least three types of magnets.

e - Given a diagram of the brain, the student will label the five parts of the brain without error.

These are sample answers that contain all three requirements. Your objectives may not be identical to these, but they are satisfactory as long as the conditions, performance, and extent are included.

WRITING BEHAVIORAL OBJECTIVES

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You will now have a chance to practice writing some behavioral objectives. Following is a series of verbal sketches. From these sketches you should be able to extract a student performance, conditions for the performance, and the extent. The sketches are from a variety of areas in occupational education. Even if you are not well acquainted with the subject matter, you should be able to extract the information necessary to write a behavioral objective in most cases.

Question 13. Write a behavioral objective for the following situation.

The instructor of the Auto Body course has asked you to help him write behavioral objectives for his course. The first thing for the students to learn, he says, is the use of equipment. For instance, the students must be able to test a spray gun and adjust it for a spray pattern. He then goes on to say that the students will be given a spray gun, necessary paint, a large pad, and pattern specifications. The students should be able to adjust the spray gun to the specifications within 15 minutes.

objective _____

_____

_____

Check your objective. Does it contain

conditions YES - NO

performance YES - NO

extent YES - NO

If it contains all three, check the answer on the next page. If not, add the missing requirements.

13 Answer. This is a suggested answer. Your answer does not have to be identical, but it must contain the conditions, performance, and extent.

Given a spray gun, necessary paint, large pad, and specifications, the student will test the spray gun and adjust the spray pattern to conform to the specifications within 15 minutes.

Question 14. Write a behavioral objective for the following situation.

You next move on to the Cosmetology class. There you help the teacher write a behavioral objective for massaging the scalp. She tells you that the scalp is massaged using basic hand movements in a planned routine. This means the scalp should be rotated using finger tips and palms of hands. The job has been done properly when the skin surface shows some reddness and flexibility and the patron shows signs of being soothed and relaxed. The student is expected to perform this task when presented with a properly draped and thoroughly shampooed patron.

Objective _____

_____

_____

Check your objective. Does it contain:

conditions YES - NO
performance YES - NO
extent YES - NO

If it contains all three, check the answer on the next page.

If not, add the missing requirements.

14 Answer. This is a suggested answer. Your answer does not have to be identical, but it must contain the conditions, performance, and extent.

Given a properly draped and thoroughly shampooed patron, the student will massage the scalp using basic hand movements in a planned routine so that the scalp will be rotated using finger tips and palms of hands. The skin surface must show some reddness and the patron shows signs of being soothed and relaxed.

Question 15. Write a behavioral objective for the following situation.

You then move on to the welding and cutting class. The instructor there is in the process of teaching the use of tools. The tool for which you will help him write a behavioral objective is the hacksaw. He tells you that students should be able to cut a 3" by 1/8" flat bar with a prescribed line to within 1/16" of a prescribed line but not to cut on or across the line.

Objective _____

15 Answer. This is a suggested answer. Your answer does not have to be identical, but it must contain the conditions, performance, and extent.

Given a 3" by 1/8" flat bar with prescribed line and a hacksaw, the student will cut the bar with the hacksaw to within 1/16" of the line but not to cut on or across the line.

Question 16. Write a behavioral objective for the following situation.

After telling friends that you are beginning to feel a bit **schizophrenic** about moving from course to course, you prepare next to help the teacher in the Electrician course. He wants students to draw the electrical symbols for common electrical devices. The devices of concern to him are the single pole switch, the double pole switch, a low voltage transformer, a 3 way switch, a 4 way switch, a convenience output, and a ceiling light. He says that drawing the correct symbol for 6 of the 7 is good enough.

Objective _____

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16 Answer. This is a suggested answer. Your answer does not have to be identical, but it must contain the conditions, performance, and extent.

Given a single pole switch, a double pole switch, low voltage transformer, a 3 way switch, a 4 way switch, a convenience output and a ceiling light, the student will draw the electrical symbols for the above electrical devices with at least 6 of 7 drawn correctly.

How well are you doing?

If you have been successful in writing behavioral objectives and are confident of your skills - turn to page 50.

If you have had trouble and would like more practice writing objectives, continue on the next page.

Question 17. Extract the conditions, performance, and extent from this situation.

You are helping the teacher of a secretarial course to prepare behavioral objectives. She wants her students to learn to calculate correct sums on a ten digit adding machine using the sub-total, non-add, and repeat keys. She says that they ought to be able to do ten problems in ten minutes with no errors. At first she is unsure of what you mean when you ask for the conditions. Quickly picking up what you mean, she says, well of course they will need a ten-key adding machine and ten problems requiring the use of the sub-total, non-add, and repeat key.

What is the performance?

_____

What are the conditions for finding these sums?

_____

_____

What is the extent?

_____

17 Answer.

performance

calculating correct sums

conditions

given a ten-key adding machine and ten problems requiring the use of the sub-total, non-add, and repeat keys

extent

ten problems in ten minutes with no errors

Question 18. Now, assemble the above components into a behavioral objective.

Objective _____

_____

_____

18 Answer. Given a ten-key adding machine and ten problems requiring the use of the sub-total, non-add, and repeat keys, find the correct sums in ten minutes with no error.

You must search the statements until you locate the student performance, the conditions under which he is to perform, and how well he must perform. The same is true when you write your own objectives. You must keep thinking about what the student must perform, the conditions under which he performs, and the extent or accuracy of the performance. If this is difficult, and it is for most of us, the reason is because the objective has probably not been thought out before and you have not identified, in your own mind, exactly what is expected of the student.

Question 19. Write a behavioral objective for the following situation.

You are now helping the teacher of a nursing course. She needs help writing an objective for surgically preparing (shaving) a designated area of a patient for surgery. She says the student is given a patient, soap, a sharp razor, and a towel. The job must be done so the area is clean shaven without observable abrasions.

Objective _____

_____

_____

Does your objective contain

- conditions YES - NO
- performance YES - NO
- extent YES - NO

If you have all three, check the answer on the next page.

If not, add them to your objective.

19 Answer. This is a suggested answer. Your answer does not have to be identical, but it must contain the conditions, performance, and extent.

Given a patient, soap, sharp razor, and a towel, shave a patient for surgery so the area is clean shaven without observable abrasions.

Question 20. Write a behavioral objective for the following situation.

You are now helping the carpentry instructor develop behavioral objectives for building porches. The particular objective under consideration is the installation of newel posts. To do the job, he tells you, the students must be given the newel posts, nails, tools, and a blueprint. Satisfactory accomplishment means the blueprint is followed, the newel posts are plumb, securely fastened, and they divide the distance into equal parts to within + - 1/16".

Objective _____

_____

_____

20 Answer. This is a suggested answer. Your answer does not have to be identical, but it must contain the condition, performance, and extent.

Given porch newel posts, nails, tools, and blueprint, install the newel posts in accordance with the blueprint so that they are plumb, securely fastened and divide the distance into equal parts to within + - 1/16".

WRITE A BEHAVIORAL OBJECTIVE FOR YOUR COURSE

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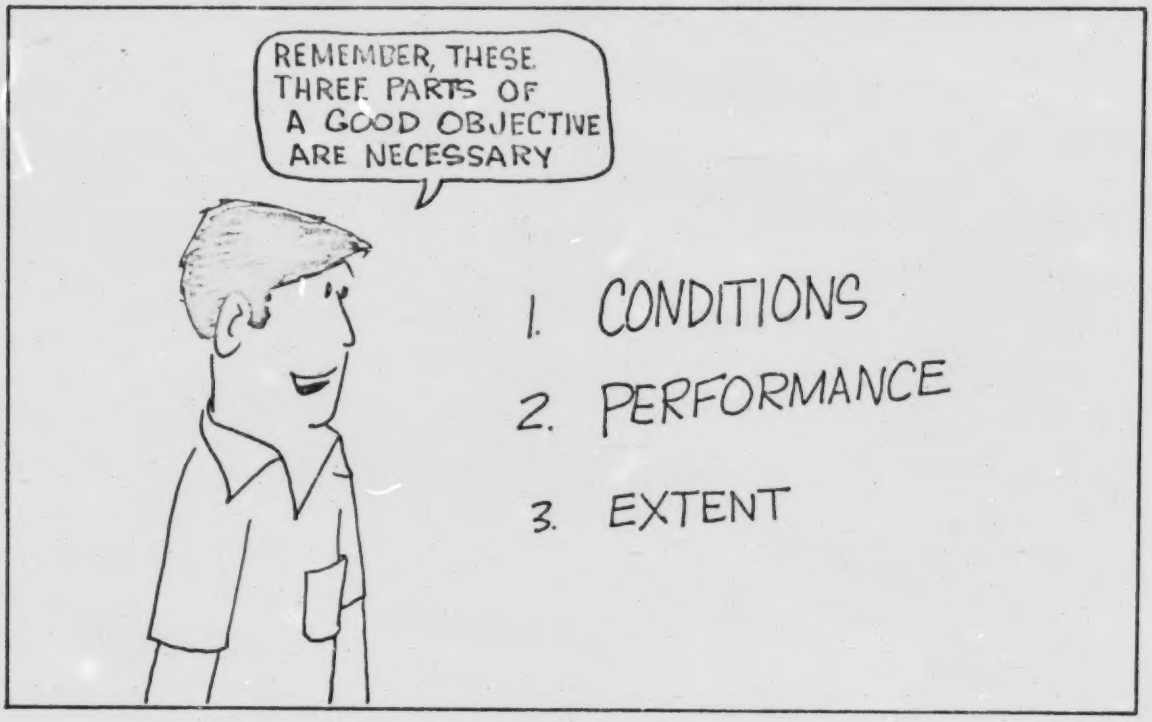

Do you feel ready to write a behavioral objective for your own course? If you feel a bit hesitant, you might like to review the last section - WRITING BEHAVIORAL OBJECTIVES. Take a close look at any objectives that are from your own course or a similar course. Pay special attention to the three parts of the objective, the conditions, performance, and extent.

Let's start out with a simple behavioral objective. Is there something in your course that the students must memorize - some terminology, definition, safety procedure or the like?

Fill in the missing components of this behavioral objective for your course.

From memory, the student will_____

_____

_____ without error.

You might have filled in such behaviors as:

- write the formula for Ohm's Law
- list the number of keys on an IBM Selectric typewriter
- state the normal temperature of the human body

etc.

Any simple memorization type behavior that must be stated, listed, written etc. will fit the above objective. Just make sure your objective includes an <u>observable</u> performance.

This next objective will be for a piece of equipment that the students must learn to use in your course.

State the piece of equipment._____

What is the required student performance?_____

_____

What are the conditions (i.e., he will need to be given the equipment, some directions, etc.)?

_____

_____

What is the extent of performance (how well, to what specifications, etc.)?_____

_____

Now, assemble the components into a behavioral objective.

Objective _____

_____

_____

As long as all conditions are listed, the performance is observable and the extent is included, you are on your way to being able to write behavioral objectives.

A check you can make is to ask a fellow instructor to read your objective. He might be able to help analyze whether or not all conditions are listed, if the extent is reasonable, and if the performance is really observable.

OTHER CONSIDERATIONS RELATED TO BEHAVIORAL OBJECTIVES

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DO OBJECTIVES STATE EVERYTHING?
WHAT ABOUT TESTING, ISN'T THE TESTING DIFFERENT?
HOW DO BEHAVIORAL OBJECTIVES FIT INTO CURRICULUM DEVELOPMENT?

The other points to consider are:

1 - other knowledge implied by a behavioral objective

2 - the testing of behavioral objectives

3 - behavioral objectives in the curriculum development process

Other knowledges implied by behavioral objectives

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While a behavioral objective might seem to be measuring a small amount of human behavior, there can be vast amounts of knowledge and skill required to accomplish the behavior.

The following example will demonstrate this point.

Given any late model American automobile, power lift, grease gun, grease, and manufacturers specifications, the student will grease the automobile according to manufacturers specifications with no fittings omitted.

Question 21. List other knowledges and skills necessary to perform this objective.

21 Answer.

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Your list might have included:

driving car onto lift (if student is old enough)

reading

operation of grease gun

recognition of grease

eye-hand coordination

location of handle to operate lift

safety procedures

discrimination between American and foreign cars

concern for customer

etc.

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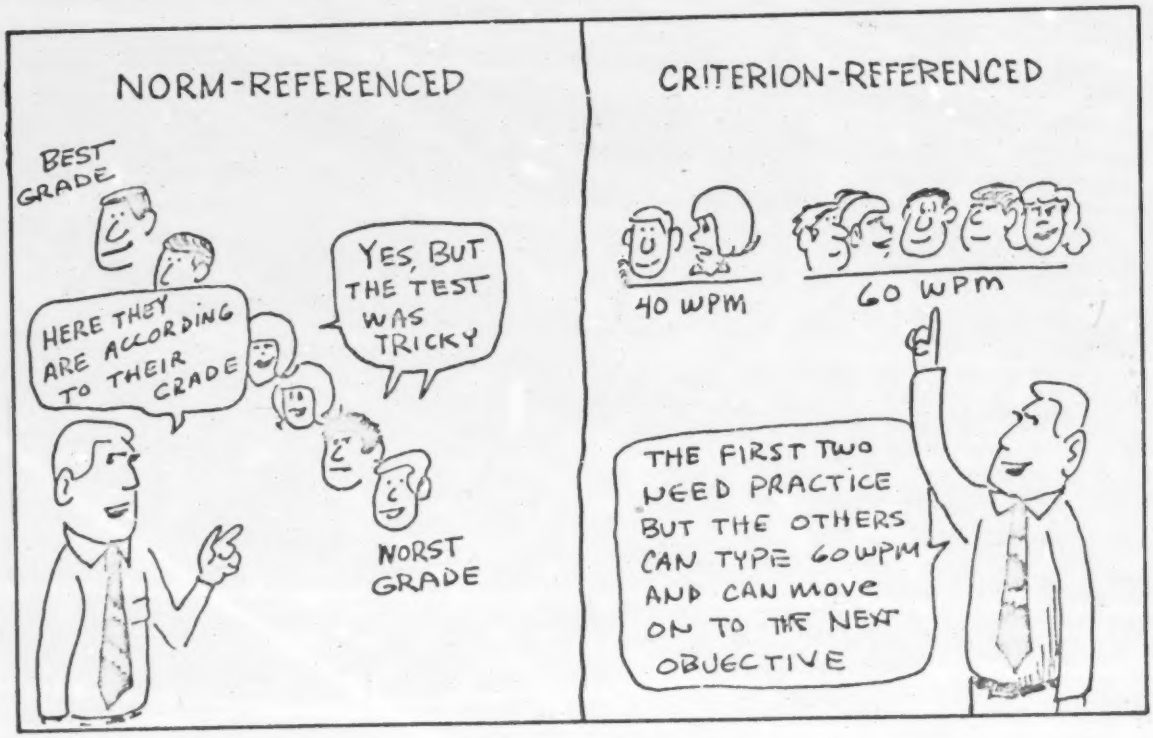
The testing of behavioral objectives (criterion-referenced)

The testing of behavioral objectives is apt to be different from the usual type of testing practiced in an academic classroom, although many teachers in occupational education may find the type of testing used with behavioral objectives familiar.

Norm-referenced testing - this type of test is used to see how well one student did in relation to his peers. You are able to say that student "A" is better than student "B" on whatever the test measures.

Criterion-referenced testing - this type of test measures whether or not a student accomplished the behavioral objective. The test measures the objective directly. You are able to say "YES, the student mastered the subject matter called for in the objective," or "NO, the student has not mastered the subject matter called for in the objective."


NORM-REFERENCED
BEST GRADE
HERE THEY ARE ACCORDING TO THEIR GRADE
YES, BUT THE TEST WAS TRICKY
NORST GRADE
CRITERION-REFERENCED
40 WPM
60 WPM
THE FIRST TWO NEED PRACTICE BUT THE OTHERS CAN TYPE 60WPM AND CAN MOVE ON TO THE NEXT OBJECTIVE

Question 22. Which test item would be the proper (criterion-referenced) test item for the behavioral objective.

Objective

Given a series of five different saws, state which saw is the crosscut saw - no error.

_____ test item 1 define what is meant by "crosscut saw"

_____ test item 2 state the use of a crosscut saw

_____ test item 3 (you must give the student a crosscut saw and board), use this saw properly to cut the board

_____ test item 4 (you must give the student 5 saws, one of which is a crosscut saw), state which is the crosscut saw

NOTE: An advanced form of testing, using criterion-referenced test items, is now available for use. This type of testing is called CAM (Comprehensive Achievement Monitoring) and provides retention data on all objectives learned earlier in the course, immediate posttest data on objectives just taught, and preinstruction data on objectives to be taught in the future. Computer programs are available to aid in large scale CAM testing.

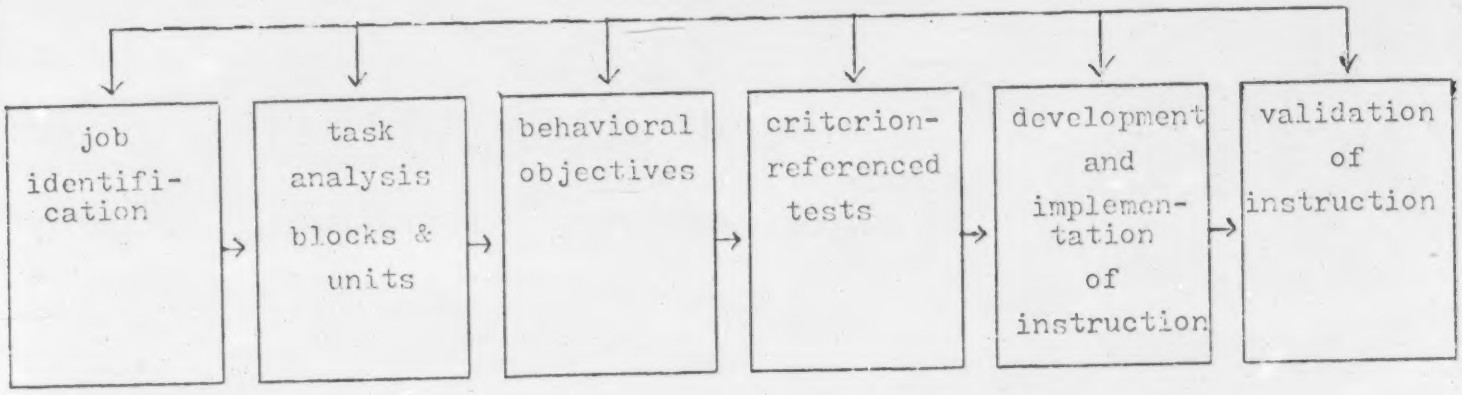
More information on CAM is available from:

Dr. William P. Gorth, Director
Center for Educational Research
School of Education
University of Massachusetts
Amherst, Mass. 01002

22 Answer. Test item 4 is correct. The other test items measure behaviors that are different from the behavior called for in the objective.

Behavioral objectives in the curriculum development process

The following briefly describes where writing behavioral objectives fits into the overall process of curriculum development.



The flow chart is quite simplified, but it shows the order in which various curriculum development tasks are performed.

job identification - You must first carefully define what job the students are being trained for.

task analysis - Then the major tasks and sub-tasks for a job have to be determined. For example, the major tasks for a secretary might be (1) typing, (2) filing, (3) taking dictation, (4) operation of business machines, (5) customer courtesy. Then each of these would be broken down into sub-tasks. For typing, the sub-tasks might be (1) speed of 60 words per minute,

(2) reading proofreader corrections, (3) changing the ribbon, (4) etc. These major behaviors and sub-behaviors could then be listed as blocks and units of a course.

behavioral objectives - You have just learned how to write behavioral objectives. The objectives should conform to the structure developed in the task analysis.

criterion-referenced tests - These are the test items written for each behavioral objective. They are written before the instruction is developed.

development and implementation of instruction - The instruction should teach the behaviors listed in the behavioral objectives.

validation - Validation requires the use of the criterion-referenced test. If most of the students can pass the test, then the instruction did the job - it taught satisfactorily. If most of the students can not pass the test, then some review is necessary. Also, this may mean that either the instructional presentation, or the objective, needs to be revised or expanded.

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CRITERION-REFERENCED TEST ITEMS

Following are the criterion-referenced test items for the behavioral objectives listed in the front of this programmed text. These test items measure your ability to accomplish what the text sets out to teach. If you have difficulty answering any of the questions correctly, review the portion of the text teaching the information related to that particular test items, or review the points of confusion with someone knowledgable in behavioral objective writing.

NOW, WE GET TESTED ON THE BEHAVIORAL OBJECTIVES WE WERE SUPPOSED TO LEARN
OH, YOU MEAN THOSE OBJECTIVES LISTED IN THE FRONT OF THIS TEXT
I'M READY!
TEACHERS LOUNGE

CRITERION-REFERENCED TEST ITEMS

1. List the three requirements of a behavioral objective.

_____

_____

_____

2. Write "YES" next to the statements that contain the requirements of a behavioral objective and "NO" next to those that don't.

_____ a. Given a fender with about a six inch dent and body hand tools, the student will remove the dent using a pick hammer and file so the fender has proper contours in one hour.

_____ b. Given the requirements for a production control chart and the needed information, the student will understand the chart completely for use on the job within one hour.

_____ c. The student will type a business letter in ten minutes.

_____ d. Given a blueprint, metal raceway, receptacle, outlet and wire, the student will install the receptacle outlet in a surface metal raceway to be fed from an existing flush receptacle. The job must be performed to national and local specifications.

_____ e. Given an insulin syringe, all necessary equipment, and a doctor's order, the student will prepare the prescribed dosage with 100% accuracy.

_____ f. The student will use a miter box to cut dowels.

_____ g. Given an IBM Selectric typewriter and an IBM Selectric ribbon, the student will change the ribbon within three minutes and the ribbon must flow freely.

_____ h. The students will all appreciate literature following the teachers presentation.

3. a. You are helping Mr. Smith prepare behavioral objectives for his ninth grade math review course. He has a unit on multiplication. By the end of the unit, he claims the students should be able to solve almost any multiplication problem they are likely to encounter in the next two years. You find that this means problems of up to 6 digits by 6 digits and includes decimals ($\underset{\times 216.853}{8379.41}$). Mr. Smith figures that students who can answer nine of ten problems of this sort have mastered what they need to know about multiplication. List the behavioral objective for the above situation.

Objective _____

_____

_____

b. You are a new teacher and will be teaching a unit on automobile painting. One topic will be preparation for painting. You already know, for the section on covering up the car, that the students will need a car to work on, masking paper and masking tape. You have also decided that you will have the students, for this particular objective, prepare a front fender for painting which

means they will have to cover the hood and door with the paper. By checking with commercial auto body shops, you have found that they expect someone coming to work for them to be able to do this sort of job in about one half hour.
List the behavioral objective for the above situation.
Objective _____

_____

_____

c. You are setting up a course in Cosmetology. It is now time to write the objectives for the section on manicuring nails. The particular objective that needs to be written is for preparing nails. You know that you must, of course, have a patron to work on, as well as manicuring tools and cosmetics. Your students must learn to (1) remove any old polish, (2) file the nails, (3) treat the cuticle. The evaluation will consist of examining the nails to see that they are well-groomed, attractive, and filed smooth.
List the behavioral objective for the above situation.
Objective _____

_____

_____

d. You have found that an introductory unit on identification of hand tools is necessary for your Carpentry course. You are now writing the objective for students to be able to determine if a saw is a rough or a finish saw. He will do this by counting the number of teeth per inch for the saw. To be able to make the differentiation the student must have a saw, ruler, and chart indicating the number of teeth per inch in a rough and finish saw. His answer, obviously, must conform to chart specifications.

List the behavioral objective for the above situation.

Objective _____

_____

_____

1. conditions
   performance
   extent ___

2. YES a.
   NO b.
   NO c.
   YES d.
   YES e.
   NO f.
   YES g.
   NO h.

3. *a. Given ten multiplication problems of six digits by six digits including decimals such as $\begin{array}{r} 8379.41 \\ \times 216.853 \end{array}$, the student will list the correct answer for at least nine of them.

   *b. Given a car, masking paper, and masking tape, the student will cover up the hood and door to prepare the fender for painting. Make sure the paper and tape are put on in one half hour so that other parts of the car are protected from overspray.

   *c. Given a patron, manicuring tools, and cosmetics, the student will remove old polish, file the nails, and treat the cuticle so the nails are well-groomed, attractive, and filed smooth.

*d. Given a saw, ruler, and chart showing the number of teeth per inch for a rough and finish saw, the student will use the ruler to count the number of teeth per inch on the saw and list whether the saw is a rough or finish saw. The answer must conform to chart specifications.

* Answers provided are samples only. Any objective that contains all of the conditions, performance, and extent called for in the situations is correct even if it is worded differently than the samples provided. For instance, your answer for "a" might read:

Given any ten multiplication problems that include decimals and are 6 digits by 6 digits, the student will solve at least nine of them correctly.

or

Given ten multiplication problems of the following type $\left(\begin{array}{r} 293.762 \\ \times 1534.11 \\ \hline \end{array}\right)$, list the answers for at least nine of them to include correct decimal placement.